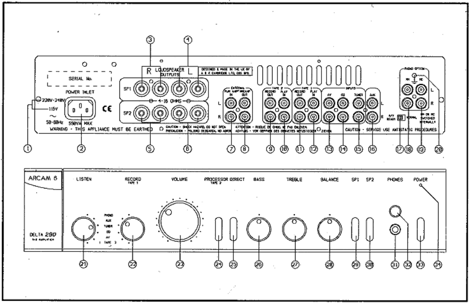
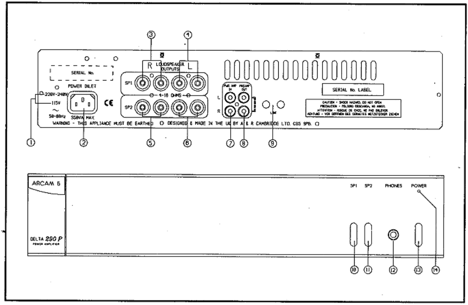
ARCAM

DELTA 290 AMPLIFIER/ DELTA 290P & XETA 290P POWER AMPLIFIER

HANDBOOK



Delta 290 Amplifier



Delta 290P Power Amplifier

INTRODUCTION

This manual is in 4 parts:

1. This section has information relevant to both the Delta 290 and Delta 290P. This includes Warnings and Cautions on use and details of how to bi-wire your loudspeakers.
2. D290 integrated amplifier operating instructions.
3. D290P power amplifier operating instructions. (The Xeta 290P power amplifier has different front panel graphics but is functionally identical).
4. Using the D290 & D290P together to bi-amp your loudspeakers.

N.B. Circled numbers eg ② refer to items on the diagrams inside the flap of the front cover.

INSTALLATION

① Check that your mains supply voltage agrees with the voltage setting indicated on the rear panel of the unit.

- If your mains supply voltage is different, consult your Arcam dealer.

MAINS SAFETY

- This product is normally supplied with a moulded mains plug already fitted to the lead. If for any reason the plug needs to be removed, **it must be disposed of immediately and securely**, as it is a potential shock hazard when inserted into a mains socket.
- If the plug is removed then the remaining lead must be rewired as follows:
- The **blue** wire must be connected to the terminal which is coloured **blue** or marked with the letter **N**.
- The **brown** wire must be connected to the terminal which is coloured **brown** or marked with the letter **L**.
- The **green and yellow** wire must be connected to the terminal which is coloured **green and yellow**, or marked with the letter **E** or the safety earth symbol.
- When replacing the fuse in the supplied moulded mains plug, the integral fuse holder/cover must always be refitted.

- **Warning:** This apparatus must be earthed.

SAFETY STANDARD

- This product has been designed to meet the IEC 65 international electrical safety standard.

MAINS SUPPLY CONNECTIONS

② Insert the IEC line socket of the mains lead fully into the power inlet on the rear panel. Connect the other end to your mains supply.

CAUTION: Your Delta 290 and D290P generate heat when in use, particularly at higher volumes. It is therefore most important never to obstruct the ventilation slots on the top and bottom of the unit as this will cause overheating.

If the temperature of the internal heatsinks rises above a safe level, then a thermal cut out within the amplifier will operate.
The POWER LED on the front panel will turn amber and the output protection relays will temporarily remove the feed to the loudspeakers. The system will reset itself as the heatsinks cool down.
Please note that under certain extreme conditions it is possible for the Delta 290 or D290P's thermal cut out to operate when playing music at very high levels.

- If you have only one tape deck connect it to the TAPE 1 sockets.

⑪ TAPE 1 RECORD OUT - Connect to your tape deck's input (RECORD).

⑫ TAPE 1 PLAY IN - Connect to your tape deck's output (PLAY).

⑨ TAPE 2 RECORD OUT - Connect to your tape deck's input (RECORD) or to your A/V processor's Tape or Line inputs.

⑩ TAPE 2 PLAY IN - Connect to your tape deck's output (PLAY) or to your A/V processor's Tape or Line outputs.

⑬ A/V - Suitable for connecting an Audio/Visual product such as a VCR, Laserdisc player or Nicam tuner.

⑭ CD - For connecting your CD player or DAC.

⑮ TUNER - For connecting your radio tuner.

⑯ AUX - For connecting any unit with a line level output, eg. tape deck, tuner etc.

- PHONO OPTION - **Please note:** The phono inputs are on a separate plug-in module which your Arcam dealer or distributor can supply and fit.
  This module is compatible with most high output moving coil and moving magnet cartridges (MM) and low output moving coil cartridges (MC).
  MM or MC is selected via an internal switch. Your cartridge type should be specified when the module is fitted.

⑱ MM - For connecting a turntable fitted with a high output moving coil or a moving magnet (MM) cartridge.

⑲ MC - For connecting a turntable fitted with a low output moving coil (MC) cartridge.

⑳ GROUND TERMINAL - For connecting your turntable's earth lead (if fitted).

OPERATION OF THE DELTA 290

⑰ NORMAL/ A/V READY SWITCH - With the switch set to NORMAL the unit functions as a standard amplifier.
For use with A/V decoders with its own volume control, such as the Arcam Xeta 2, set the switch to 'A/V READY'. This bypasses the Delta 290's volume control when 'PROCESSOR/TAPE 2' input is selected, to provide a fixed gain amplifier.
The volume control and MUTE cannot be operated by remote in this situation.

㉑ LISTEN SELECTOR - Selects the input you wish to listen to. This signal also goes to the TAPE 2 output sockets for recording on a cassette deck or for external processing. The selector can also be operated by remote control. (See Remote Control Functions).

㉒ RECORD SELECTOR - Selects the input you wish to record on TAPE 1. This operates independently of the LISTEN function.

㉓ VOLUME - Adjusts the volume level of the loudspeakers and headphones. Note that with the volume at minimum it may be possible to still hear music very faintly. This is normal.
VOLUME can also be operated by remote control (See Remote Control functions).

㉔ PROCESSOR/TAPE 2- This is a tape loop to enable monitoring of a recording on a 3 head cassette deck. It can also be used to enable line inputs to be sent to an external surround decoder such as the Arcam Xeta 2 for processing before being routed back to the amplifier.
For playback of a cassette deck or if using an A/V processor attached to TAPE 2 press the button in.
Note: PROCESSOR/TAPE 2 is not remote controllable.

㉕ DIRECT - Bypasses bass, treble and balance controls. This affects all inputs, and will generally give a small improvement in sound quality and a useful reduction in the level of background hiss.

㉖ BASS - Rotate clockwise to boost the bass response and anti-clockwise to cut the bass response. For a flat response leave in the central 'click' position.

㉗ TREBLE - Rotate clockwise to boost the treble response and anti-clockwise to cut the treble response. For a flat response leave in the central 'click' position.

㉘ BALANCE - Rotate clockwise or anti-clockwise to move the position of the stereo image. This may be necessary if it is not possible to sit centrally between the speakers. In normal use leave in the central 'click' position.

㉙ SP1 - Selects or defeats the main pair of speakers. Push the button in to select.

㉚ SP2 - Selects or defeats the secondary pair of speakers. Push the button in to select.

㉛ HEADPHONES SOCKET - Accepts headphones rated between 8 ohms and 2kohms fitted with a 6.3mm stereo jack plug. If your headphones are fitted with a different plug contact your dealer for a suitable adaptor. If you wish to listen on headphones only, use SP1 and SP2 (if necessary) to mute the speakers.

- The headphone socket is always switched on, irrespective of the positions of switches ㉙ and ㉚.

㉜ REMOTE RECEIVER - Ensure the remote receiver is not obscured or commands from the remote control handset will not be received.

㉝ POWER - Switches the unit on and off.

㉞ POWER LED - The LED above the POWER switch will initially glow amber. After a few seconds, it will glow green. When the LED glows amber, the speakers are disconnected and an internal protection circuit is activated or the unit has been muted by use of the remote control. If this LED glows amber during normal use it may be due to the amplifier overheating or an output overload. Check the amplifier is properly ventilated.
Switch the amplifier off and wait for 2-3 minutes before switching on again. If the LED continues to glow amber, switch the unit off, remove all the speaker cables and switch on again. If the LED goes to green upon switch on then check the speaker and speaker cables for short circuits before reconnecting them. If the LED continues to glow amber with no speakers connected contact your Arcam dealer.

TAPE RECORDING

- Both sets of tape sockets (TAPE 1 and TAPE 2) are identical in sensitivity and suitable for use with almost any type of recorder (cassette, hi-fi VCR, reel to reel, DAT, etc.).

- RECORDING (TAPE 1): Any input signal available on the Delta 290 may be routed to the TAPE 1 output sockets by using the RECORD selector to select the appropriate input.
  Set your tape recorder into its recording mode and the selected input will be recorded. Selecting the same input to listen to will not affect the signal sent out to the recorder and will now enable you to listen to the input being recorded. You may listen to another input whilst recording on TAPE 1 by use of the LISTEN selector.
  If your tape recorder is a 3 head design, this will allow A-B monitoring of the actual recording while it is taking place. Switching the listen switch between the original source and TAPE 1 during recording will then allow you to make a true 'before and after' (A-B) comparison.

- PLAYBACK (TAPE 1): Set LISTEN to TAPE 1 and set your tape recorder in its playback mode.

- RECORDING AND PLAYBACK, TAPE 2: Proceed as above, except use the TAPE 2 sockets and select the input to be recorded by use of the LISTEN selector. Use the PROCESSOR/TAPE 2 button when monitoring or playing back the recording.
  Do not move the listen selector whilst recording or you will lose the signal.

- TAPE TO TAPE DUBBING: The Delta 290 allows 2 way tape dubbing (copying) from TAPE 1 to TAPE 2 or vice versa.

  For example, to copy from a recorder connected to the TAPE 2 sockets to a recorder connected to TAPE 1, first switch the RECORD selector on the Delta 290 to TAPE 2. This routes the TAPE 2 signal to TAPE 1's output. Then set the first tape recorder into its 'record' mode and the second to 'playback' mode to enable the transfer to take place. If you wish to monitor the transfer while it is taking place switch LISTEN to TAPE 1.

  To record from TAPE 1 to TAPE 2 set listen to TAPE 1. To monitor push the PROCESSOR/TAPE 2 button in.

PRE/POWER CONNECTIONS

⑦ PWR AMP IN - To use your Delta 290 as a power amplifier, connect the output of your pre-amplifier to PWR AMP IN. Set the internal selector switch to EXT INPUT position. Under these circumstances it has exactly the same specification and performance as a Delta 290P power amplifier. Contact your dealer or Arcam for more details.

⑧ PREAMP OUT - To use your Delta 290 as a pre-amplifier, connect PREAMP OUT to your power amplifier's input.
Please note: the PREAMP OUT sockets are permanently active.

REMOTE CONTROL FUNCTIONS

- Your Delta 290 amplifier is supplied with the Arcam CR25 "Handi Remote" infra-red remote control handset, which has buttons to allow the simple operation of other products. It is supplied with 2AA batteries - ensure these are inserted correctly.

- The remote allows you to operate the Delta 290 plus some basic functions of an Arcam† or Philips based CD player, a remote controlled tuner (such as the Arcam Delta 280*), the Arcam Delta Black Box 500 DACC and an Arcam amplifier with remote control facility(the Alpha 6/ Alpha 6 Plus, Delta 110/110S pre amplifiers and the Xeta One/ Two Home Cinema amplifiers).

* Note: versions of the Delta 280 FM tuner manufactured before April 1995 will not respond to the programme up/down buttons on the "Handi Remote".

- REMOTE MODE - The Delta 290 is fitted with an internal Remote Mode selector switch, which is factory-set to NORMAL. In NORMAL mode, the Arcam "Handi-Remote" or Arcam CR200 System Remote will synchronise the operation of any Arcam CD player or transport, cassette deck or remote control tuner with the LISTEN selector on the Delta 290, all at the touch of a single button.
  For example, using the remote in CD mode, press PLAY, and the CD player will start the disc and the LISTEN function selects CD.
  If this facility is not required, the internal selector switch should be set to UNIQUE. The LISTEN selector switch can still be operated by either remote control handset.
- The MUTE button mutes the speaker connections and pre-amp outputs. Both tape outputs however remain active. In MUTE mode the power LED will turn amber until mute is disabled by either pressing MUTE again or pressing volume -/+.
- Input selection may also be made via the CR25 and CR200 remote control handsets. Where fitted, the phono stage is selected with the PHONO button. All other inputs are made active when the relevant button is pressed. TAPE 2 may be chosen via the front panel switch but not by the remote control handset.

Note: The SHIFT button does not initiate any functions within the Delta 290/290P.

DELTA 290P POWER AMPLIFIER

Please refer to drawing inside front cover.

LOUDSPEAKER CONNECTIONS

- The speaker terminals are colour coded red for positive and black for negative. These terminals are also labelled 'R' for the right channel speakers and 'L' for the left channel speakers.

③,④ Connect terminals ③ to your right speaker and terminals ④ to your left speaker.

- Connect the red cable termination to the red terminals and the other cable termination to the black terminal. If your speaker cable has bare ends, the positive conductor can usually be identified by a ridge or coloured marking. Ensure that no stray strands are allowed to touch another cable or the amplifier's casing. This can cause a short circuit and damage your amplifier!

⑤,⑥ To drive a second pair of speakers, connect terminals ⑤ to the right speaker and terminals ⑥ to the left speaker.

† Except the Alpha One CD player, which uses a different remote control language.

- The Delta 290P can drive two pairs of loudspeakers, simultaneously if required, providing both pairs are rated between 8 and 16 ohms. Either pair can be selected using the switches labelled SP1 and SP2 on the front panel. To avoid overheating, the combined load impedance as seen by the amplifier should not fall below 4 ohms per channel.

CONNECTING YOUR SOURCE COMPONENT

⑦ PWR AMP IN -Connect to your pre-amplifier outputs.

⑧ PREAMP OUT: The 290P can be connected to provide two mono outputs from a single input. Using the U-link ⑨ supplied, connect the PREAMP OUT sockets ⑧ together.
Utilising one Delta 290P per loudspeaker in this manner will allow bi-amplifying of bi-wireable loudspeakers. This is particularly beneficial for top quality stereo installations with a separate pre-amplifier, or for the left, centre and right channel loudspeakers in a five speaker Dolby Pro Logic system. Contact your Arcam dealer for more detailed information.

- **Daisy Chain** - The Delta 290P is capable of driving further Delta 290P amplifiers (or any other power amplifier), to drive more speakers (eg. those in other rooms or tri-amplified speakers etc). Connect the extra power amplifier inputs to the PREAMP OUT outputs ⑧ left to left, right to right.

FRONT PANEL

⑩,⑪ SP1 and SP2 - Pressing the SP1 switch turns on the speakers connected to the SP1 (upper) set of output terminals on the rear panel. Similarly the SP2 switch turns on the speakers connected to the SP2 (lower) set of output terminals.

- Both the SP1 and SP2 switches can be turned on at the same time, provided that the combined impedance of the two pairs of speakers does not fall below 4 ohms per channel.

Important note: If both switches are turned off then the amplifier will appear not to be functioning, as all speakers will be switched off!

⑫ HEADPHONES SOCKET - Accepts headphones rated between 8ohms and 2kohms fitted with a 6.3mm stereo jack plug. If your headphones are fitted with a different plug contact your dealer for a suitable adaptor.

- The headphone socket is always switched on, irrespective of the positions of switches ⑩ and ⑪.

⑬ POWER - Switches the power on and off.

⑭ POWER LED - This will initially glow amber. After a few seconds, it will glow green. When the LED glows amber, the speakers are disconnected and an internal protection circuit is activated.

- If this LED glows amber during normal use it may be due to the amplifier overheating or an output overload. Check the amplifier is properly ventilated. Switch the amplifier off and wait for 2-3 minutes before switching on again.

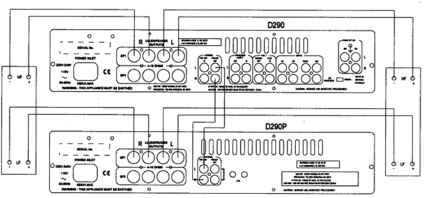
If the LED continues to glow amber, switch the unit off, remove all the speaker cables and switch on again. If the LED goes to green on switch on then check the speaker and speaker cables for short circuits before reconnecting them. If the LED continues to glow amber with no speakers connected contact your Arcam dealer.

ADDING A DELTA 290P TO AN EXISTING DELTA 290

If you are using a Delta 290, a Delta 290P can be added to bi-amplify a pair of bi-wireable loudspeakers. This will reap substantial improvements in sound quality if the following precautions are observed.

- Always switch on the Delta 290 and allow it to stabilise (indicator light turns green) before switching on the Delta 290P.
- The Delta 290 and Delta 290P power amplifier are placed on separate shelves. Stacking the units on top of each other will reduce the sound quality slightly. It will also reduce ventilation and consequently the power handling capability.
- The existing Delta 290 should be used to drive the loudspeakers' HF (high frequency) units. The new Delta 290P is utilised for the LF (bass) drivers, as shown in the wiring diagram below.
- At the end of a listening session the Delta 290P should always be turned off first.
- High quality interconnect cables should be used between the Delta 290 and Delta 290P.
- The use of high quality interconnect and speaker cables in your system is essential to obtain good sound quality. Cables from the AudioQuest range are ideal partners for Arcam products. Contact your dealer for further details.
- **WARNING** - Ensure that the links connecting the red terminals and the black terminals on the speakers are removed before switching on the amplifiers. Failure to do this could cause damage to one or both amplifiers and this is not covered under the warranty.

BIAMPLIFICATION WIRING DIAGRAM USING DELTA 290 and DELTA 290P



TECHNICAL SPECIFICATION

Delta 290P Power Amplifier

Output power (20Hz-20kHz at 0.5%THD)		70W, both channels, 8Ω
		140W, single channel, 4Ω, 1kHz
Harmonic Distortion, 60W, 8Ω at 1kHz		0.02% typical
Peak current rating		± 18 amps
Input impedance		7.5kΩ
Input sensitivity		670mV for 75W/ 8Ω
Gain (1kHz)		31.3dB ± 0.2dB
Frequency response		10Hz-20kHz ± 0.5dB
Noise (CCIR) ref. rated power		-100dB
Mains voltage		230V/115V ±12%
Power consumption(max)		550VA
Size W/D/H mm.		430x300x92
Weight	nett	6.0kg
	packed	7.0kg
Supplied accessories		Mains lead

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PROBLEMS?

If your dealer is unable to answer any query regarding this or any other Arcam product please contact Arcam Customer Services on +44 (0)1223 440964 or write to us at the address on the back cover of this handbook.

TECHNICAL SPECIFICATION

Delta 290 Amplifier

Outout power (20Hz-20kHz at 0.5%THD)	70W, both channels into 8Ω 140W, single channel into 4Ω, 1kHz
Harmonic Distortion, 60W, 8Ω at 1kHz	0.02% typical
Peak current rating	± 18 amps
Tone controls (typical variation)	± 5dB at 100Hz and 10kHz
L/R Crosstalk	-72dB at 1kHz
INPUTS	
Line inputs:	Sensitivity 165mV
Noise (CCIR) ref. rated power	-99dB typical
Input impedance	4.7kΩ
Overload margin	>50dB
A/V loop input (A/V mode)	Sensitivity 690mV
Input impedance	4.7kΩ
Power amp in	Sensitivity 670mV
Input impedance	7.5kΩ
Phono board (if fitted):	Sensitivity 2.6mV MM, 260μV MC
Noise (CCIR) ref. rated power	-79dB MM, -73dB MC
Input impedance	47kΩ MM, 300Ω MC
Overload margin	35dB
OUTPUTS	
Preamplifier Output	
Nominal output level	800mV
Maximum output level	8V
Output impedance	100Ω
Tape/ AUX outputs:	
Output impedance	100Ω
Headphones:	
Maximum output level into 600Ω	8V
Output impedance	100Ω
Mains voltage	230V/115V ±12%
Power consumption(max)	550VA
Dimensions W/D/H mm.	430x315x92
Weight nett	6.5kg
packed	7.7kg
Supplied accessories	Mains lead CR 25 Handi-Remote

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